

Endovascular Intervention and Management of Pediatric Mandibular Arteriovenous Malformation: A Case Report

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No Disclosures

Introduction

- Arteriovenous malformation of the mandible are a rare and potentially life threatening entity^{1,2,3,4}. Exsanguination from these lesions is a well documented event^{1,2}. Management of these lesions is unfortunately unclear and unstandardized due to their rare occurrence. Their presentation is wide and varied ranging from complaints of a loose tooth to acute hemorrhage and shock.
- Currently a multidisciplinary approach that typically involves input from oral maxillofacial surgeons (OMFS), otolaryngologists, and endovascular neurointerventionalists is required to manage these lesions^{1,2,3}.
- Due to the lesions high rate of recurrence and proximity to vital structures, gross surgical resection of the lesion is often required². Gross surgical resection brings its own challenges in the growing pediatric patient including considerable aesthetic deformity and growth disturbances^{2,3}. Therefore definitive treatment with endovascular techniques is a reasonable goal for therapeutic management.
- The case presented here is an example of a pediatric mandibular arteriovenous malformation that was treated entirely with endovascular management.

Presentation

- 17 y/o female with no medical history who presented to Cooper ER from Orthodontists office. Patient had been complaining of a loose tooth (#18) since the previous year. Initially thought to be due to gingival disease patient was prescribed a mouth wash with no resolution of symptoms. Patient was sent for Panorex and a left posterior mandibular lesion was found. Patient was initially seen by oral maxillofacial surgery in the ED where CT of head and neck was performed. OMFS notes that patient had bounding pulse and palpable thrill along left mandible. Arteriovenous malformation of left jaw is diagnosed. Neurosurgery is consulted. Decision made to take patient for angiography and embolization



Figure 1. CTA demonstrating left mandibular AVM.

Methods

First Intervention

- Access: right femoral artery
- 6 French sheath placed, 0.038" glide wire and 6 French Envoy DA catheter used for diagnostic portion. Echelon 10 microcatheter used for lingual feeders
- On the right carotid there is one lingual feeder to left side AVM. Right supraclinoid carotid, R MCA, R ACA all unremarkable.
- Left common carotid reveals large malformation with multiple feeders from the external carotid artery. Left lingual artery and internal maxillary are the major feeders. Left supraclinoid carotid, L MCA, L ACA unremarkable.
- Intervention:
 - Synchro 2 microwire guided Echelon 10 catheter into left lingual artery
 - Microcatheter was prepped with DMSO and then Onyx 18 was injected into lingual artery feeder, catheter was removed
 - Post embolization angiography demonstrated occlusion of vessel, two more feeder vessels are embolized in similar fashion.
 - Mild slowing of AVM demonstrated
 - Intervention stopped due to contrast load and radiation exposure



Figure 2. Angiogram demonstrating AVM of mandibular with large dilated communicating jugular vein. Left lingual artery feeders appreciated.



Figure 3. Angiogram of left lingual arterial feeders. Two have undergone liquid embolization



Figure 4. Angiogram after three lingual artery feeders have been embolized still demonstrates persistent filling of malformation with drainage into venous varix

Second Intervention

- Access: right femoral artery and left femoral vein
- 6 French sheath placed, 0.038" glide wire and 6 French Envoy DA catheter used for diagnostic portion. Echelon 10 microcatheter used for arterial feeders. On the venous intervention, the 6 French Envoy catheterized the internal jugular vein. Then a SL 10 micro catheter was used to catheterize the left mandibular vein. An IM VB catheter was used for the left communicating jugular vein.
- Intervention
 - After catheterizing the left internal maxillary artery with an Echelon 10 catheter, dead space filled with DMSO and Onyx 18 deployed, Catheter is removed and replaced. This is repeated for all 5 feeders of the internal maxillary artery.
 - For the venous intervention multiple catheters were attempted for access to communicating jugular vein. Eventually was able to get IM VB catheter in. Using a Synchro microwire an SL-10 catheter could be advanced to the venous varix. The catheter could not be advanced past the mandibular vein. Here multiple coils were deployed to obliterate venous side. Post intervention angiogram demonstrated complete resolution of arteriovenous shunting.

Results

- .At the conclusion of the second intervention no high flow arteriovenous shunting was appreciated. Patient did well with procedure. She suffered no side effects from the intervention aside from local edema in the area of the jaw. Patient will be followed with another angiogram 3 months after intervention.

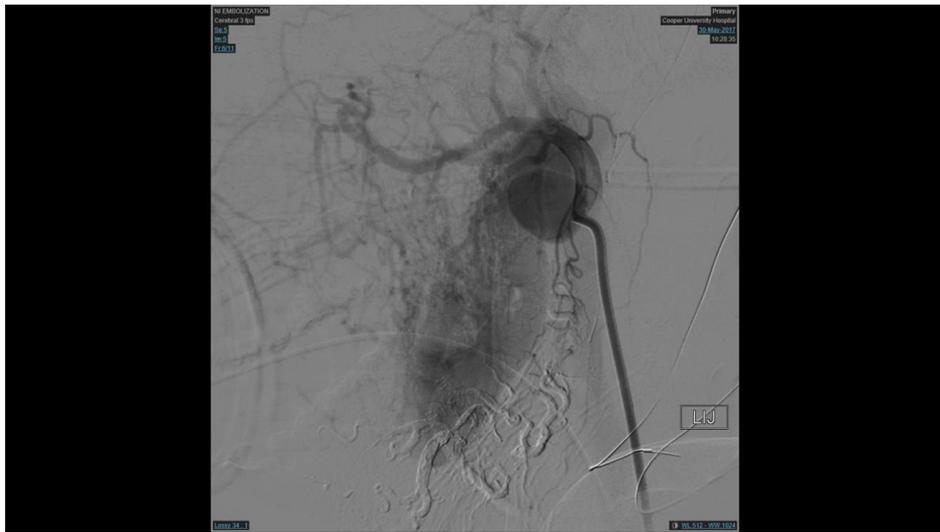


Figure 5. Angiogram showing the arterial feeders from the left internal maxillary artery and the dilated venous structures



Figure 7. Angiogram demonstrating coil embolization of the venous varix



• **Figure 6.** Angiogram showing left internal maxillary artery after some arterial feeders have been embolized.

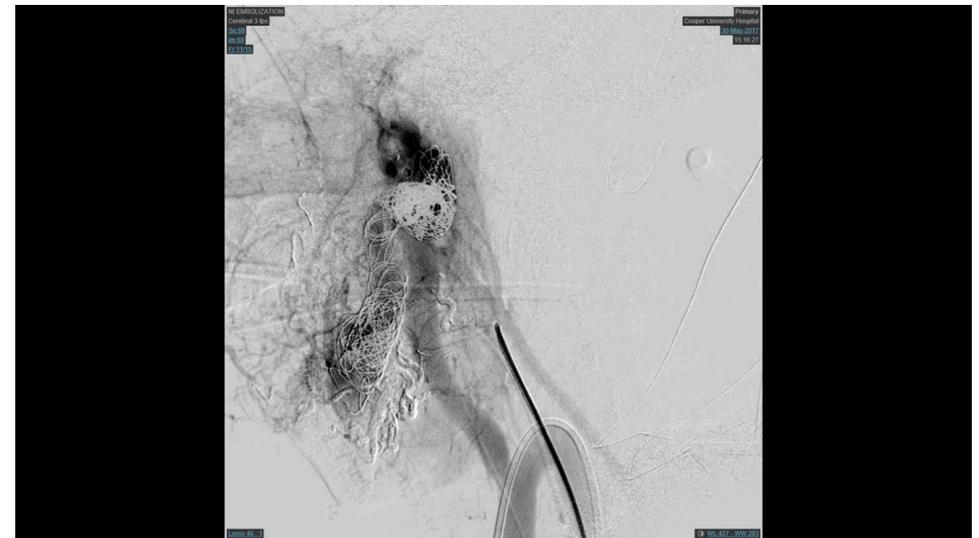


Figure 8. Angiogram showing further coil embolization of dilated venous structures.

Summary and Conclusions

Mandibular AVMs represent a dangerous entity that is often difficult to treat. There is no question that endovascular embolization is essential for prevention of life threatening exsanguination ^{1,2,3,4} . Surgery is often required for definitive management due to the propensity of these lesions to reoccur ^{1,2} . Endovascular treatment alone has had mixed results ^{2,3} . Here we present a case where intervention was the sole treatment for a mandibular AVM. By obliterating both the arterial feeders and the venous varix of this high flow AVM, we hope to avoid recurrence and deforming surgical resection.



Figure 9. X-ray at the conclusion of second intervention. Can appreciate the embolized arterial feeders and the extent of coil embolization required for the mandibular venous varix.

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